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AMENDMENTS TO THE CLAIMS

1-67. (Cancelled)

68. (Currently Amended) A process for electrochemical deposition of copper ~~metal~~ onto a surface of a semiconductor workpiece in a plating tool, comprising:

providing a workpiece having a dielectric layer in which recesses have been formed, a barrier layer on the dielectric layer, and a copper seed layer on the barrier layer;

exposing a surface of the ~~microelectronic~~ workpiece to a plating solution in a plating chamber in the tool, the plating solution including a principal metal species comprising copper to be deposited;

applying plating power between the surface of the workpiece and an electrode ~~disposed in contact with~~ electrically coupled to the plating solution to electrolytically deposit ~~metal~~ copper onto the seed layer and into the recesses~~surface~~, wherein plating power is applied

at a first current density for a first period of time to deposit a first amount of ~~the metal~~ copper into the recesses~~onto the surface of the workpiece~~, and subsequently

at a second current density for a second period of time to deposit a second amount of ~~the metal~~ copper onto the first amount of ~~metal~~copper to fill the recesses with copper, wherein the second current density is greater than the first current density and a majority of the ~~metal~~ copper deposited onto the surface of the workpiece is deposited during the second time period, and wherein the second amount of copper has relatively small grain sizes; and

annealing ~~subjecting the surface of~~ the copper in the recesses at ~~microelectronic workpiece to an elevated temperature annealing process at~~ a predetermined elevated temperature while the workpiece